Microservices

Definition, Standards and Patterns

Java Dev-Ops Cloud Training

V 1.0.2

SMALLRYE

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Inhalt

- MicroServices Definitions

- MicroServices Design Patterns

- Micro Profile

- Jakarta RESTful Web Services

- CDI

- SmallRye Implemenation

Microservice Definition

is an **architectural style** that structures an application as a collection of services that are

1. Independently deployable
2. Loosely coupled
3. Organized around business capabilities
4. Owned by a small team
5. Highly maintainable and testable

The phrase "Micro-Web-Services" was first used conference by Dr. Peter Rodgers in 2005.

https://en.wikipedia.org/wiki/Microservices
https://microservices.io/patterns/microservices.html

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Microservices – Definiton 2

- Microservices are small autonomous services that work togehter

https://samnewman.io/talks/principles-of-microservices/

Microservices – Definiton 3

- Is a concept to develop an application as a suite of multiple small services,

- each running on ist own process and

- Communicate with lightweight mechanisms

See also:

https://martinfowler.com/articles/microservices.html#CharacteristicsOfAMicroserviceArchitecture

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Microservices - Advantages

- A Set up standardizes practices

- Increase speed of development and deployment

- Enables easy scaling

- Are technology agnostic

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Microservices – Design Patterns

- Defines and exposes APIs via synchronous or asynchronous Messages

- Mostly Rest Services (see REST-Services Slides and definitons)

- Operations
  - Flexible Configuration Management
  - (Central) Monitoring – and Service Metrics
  - Service Availability and Network failure handling

- Security
  - Mostly via Access Tokens
  - E.g. Json-Web-Token

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Micro-Profile – Defininition

- Enterprise Java for a microservice architecture

- Implements microservice design patterns

- Standardized via Eclipse Foundation

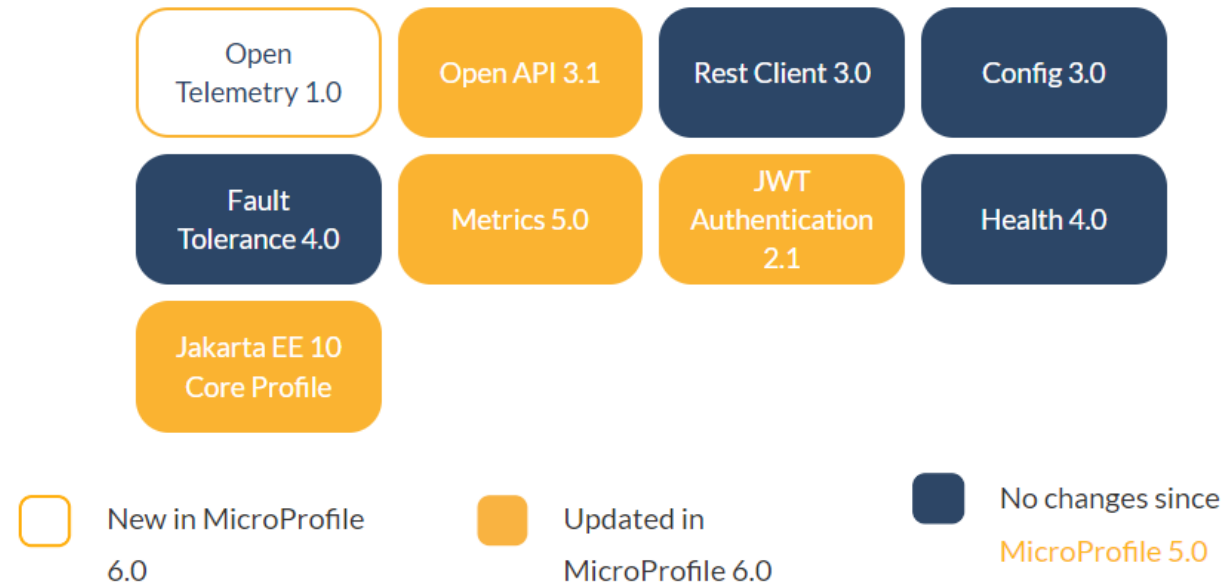- Open Source

https://microprofile.io/

MicroProfile 5.0 - Specification

The MicroProfile 6.0 is based on Jakarta EE 10 Core Profile, which also enables MicroProfile APIs to be used together with the full set of Jakarta EE 10 specifications.

Open Tracing 3.0	Open API 3.0	Rest Client 3.0	Config 3.0
Fault Tolerance 4.0	Metrics 4.0	JWT Propagation 2.0	Health 4.0
CDI 3.0	JSON-P 2.0	JAX-RS 3.0	JSON-B 2.0
Jakarta Annotation 2.0			

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MicroProfile – Specification – Profile v 6.0

Open Telemetry 1.0	Open API 3.1	Rest Client 3.0	Config 3.0
Fault Tolerance 4.0	Metrics 5.0	JWT Authentication 2.1	Health 4.0
Jakarta EE 10 Core Profile			

New in MicroProfile 6.0 **Updated in MicroProfile 6.0** **No changes since MicroProfile 5.0**

https://microprofile.io/2023/01/10/microprofile-6-0-release/

https://microprofile.io/

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Current MicroProfile [Implementations](#)

MicroProfile - Jakarta RESTful Web Services

- The specification defines a set of Java APIs for the development of Web services built according to the Representational State Transfer[1] (REST) architectural style.

- Pojo Based

- HTTP Centric

- Format Independent

- Container Independent

- Inclusion in Jakarta EE

MicroProfile - CDI Specification

- Provides the CDI Specification included in the Micro Profile Specificiation

- Specification for automatic lifecycle Managment for Beans including injection and IoC.

https://jakarta.ee/specifications/cdi/3.0/jakarta-cdi-spec-3.0.html

MicroProfile – ImplementationSmallRye.io

- MicroProfile Implementation

- Included in:
  - Quarkus
  - Wildfly
  - Open-Liberty

(https://smallrye.io)

Documentation Links

- Microservices Defintions
  - https://en.wikipedia.org/wiki/Microservices
  - https://microservices.io/patterns/microservices.html
  - https://martinfowler.com/articles/microservices.html#CharacteristicsOfAMicroserviceArchitecture
  - https://samnewman.io/talks/principles-of-microservices/
- Micro Profiles
  - https://microprofile.io/
  - https://jakarta.ee/specifications/restful-ws/3.0/jakarta-restful-ws-spec-3.0.html
  - https://jakarta.ee/specifications/cdi/3.0/jakarta-cdi-spec-3.0.html

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Danke für Ihre Aufmerksamkeit